

CLAIMS

1. A broadcast program recording apparatus for receiving broadcast data and recording a target broadcast program which is preset to be recorded onto a recording medium, the recording starting at a scheduled broadcast time of the target broadcast program, the apparatus comprising:

an extension information obtaining unit operable to obtain extension information showing that broadcast of a program preceding the target broadcast program will be extended;

a judging unit operable to judge, if the extension information is obtained, whether broadcast data being recorded after the scheduled broadcast time is segment data that is sufficiently shorter than the target broadcast program or program data;

a monitoring unit operable to monitor, after the judging unit judges that the broadcast data is segment data, whether segment data of a same type is consecutively received;

an extracting unit operable to extract, if the judging unit judges that the broadcast data is program data, an end time of a piece of segment data immediately preceding the program data, the extraction being performed when a predetermined condition is satisfied; and

a start-position recording unit operable to record, as a start position of the target broadcast program, a position corresponding on the recording medium to the extracted end time.

2. The broadcast program recording apparatus according to Claim 1, wherein

the predetermined condition is that a total time period of consecutively received pieces of segment data is longer than a reference value,

the monitoring unit is an accumulating unit operable to keep accumulating, if the judging unit judges that the broadcast data is segment data, a time period of each piece of segment data until the judging unit next judges that the broadcast data is program data, and

the extracting unit (i) includes a comparison subunit operable to compare, if the judging unit judges that the broadcast data is program data, a reference value with a total time period of pieces of segment data up to the one immediately preceding the program data, and (ii) extracts the end time of the immediately preceding piece of segment data if the comparison subunit judges that the total time period is equal to or longer than the reference value.

3. The broadcast program recording apparatus according to Claim 2, wherein

each piece of segment data is CM data for displaying an advertisement,

the time period of each piece of segment data is unique to a CM data broadcast, and

the judging unit makes the judgment by comparing the unique time period with a time interval between transition frames

present in the broadcast data being recorded.

4. The broadcast program recording apparatus according to Claim 3, wherein

5 the unique time period is an integral multiple of a minimum time period of a CM data broadcast and equal to or shorter than a maximum time period of a CM data broadcast.

5. The broadcast program recording apparatus according to Claim 10 4, wherein

the reference value is an integral multiple of the minimum time period and longer than the maximum time period.

6. The broadcast program recording apparatus according to Claim 15 3, wherein

if the broadcast data includes audio data, each transition frame is a silent frame, and

the judging unit judges that the broadcast data is CM data if a time interval between two silent frames successive in time 20 sequence is equal to the unique time period.

7. The broadcast program recording apparatus according to Claim 3, wherein

25 the monitoring unit includes a timer that is set each time a silent frame is detected, and judges that the broadcast data being recorded is program data if the timer measures a predetermined time period before reception of a next silent

frame.

8. The broadcast program recording apparatus according to Claim 3, wherein

5 if the broadcast data includes image data, each transition frame is a black frame, and

the judging unit detects two black frames successive in time sequence, and judges that the broadcast data is CM data if a time interval between the two black frames is equal to the
10 unique time period.

9. The broadcast program recording apparatus according to Claim 3, wherein

the monitoring unit includes a timer that is set each time
15 a black frame is detected, and judges that the broadcast data being recorded is program data if the timer measures a predetermined time period before reception of a next black frame.

10. The broadcast program recording apparatus according to Claim 1, wherein
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the predetermined condition is a detection rule,

the apparatus further comprising:

a storage unit that stores therein two detection rules;
and

25 a selecting unit operable to select one of the detection rules stored in the storage unit, based on a channel on which the target broadcast program is scheduled to be broadcast and/or

a region in which the apparatus is sited, wherein

the start-position recording unit judges whether the end time of the piece of segment data immediately preceding the program data is acceptable as the start position of the target broadcast program in accordance with the selected detection rule.

11. The broadcast program recording apparatus according to claim 10, wherein

one of the detection rules determines that in a case where two or more pieces of segment data are consecutive and a total time period of the consecutive pieces of segment data is longer than a reference value, a recording-end position of a last one of the consecutive pieces of segment data on the recording medium serves as the start position of the target broadcast program.

12. The broadcast program recording apparatus according to Claim 10, wherein

one of the detection rules determines that in a case where one or more pieces of segment data are consecutive and program data is received subsequent to the consecutive pieces of segment data, a recording-end position of a piece of segment data immediately preceding the program data serves as the start position of the target broadcast program.

13. The broadcast program recording apparatus according to Claim 1, wherein

the start-position recording unit is further operable to

record, as a recording-start position, a position on the recording medium from which the recording unit starts recording.

14. The broadcast program recording apparatus according to Claim 13, further comprising:

a program guide storage unit operable to store therein an electronic program guide showing broadcast schedules of a plurality of programs and including extension information showing that broadcast of at least one program will be extended, and

the extension information obtaining unit obtains the extension information from the electronic program guide.

15. The broadcast program recording apparatus according to Claim 13, wherein

the start-position recording unit records the start position and the recording-start position in a storage area allocated within the apparatus.

16. The broadcast program recording apparatus according to Claim 15, wherein

the start-position recording unit records, as the start position and the recording-start position, a time elapsed from the recording start to the respective position.

17. The broadcast program recording apparatus according to Claim 15, wherein

the recording medium has broadcast programs recorded thereon, including a broadcast program which was a target broadcast program, and

the storage area stores the start position and the recording-start position of the target broadcast program on the recording medium,

the apparatus further comprising:

an instruction receiving unit operable to receive an instruction for thumbnail-list display;

a first obtaining unit operable to obtain a first image from the recording medium, the first image being located at a position that is after a predetermined time from an image located at the recording-start position;

a second obtaining unit operable to obtain a second image or a third image from the recording medium, the second image being located at the recording-start position and the third image being located at a position that is after a predetermined time from the second image;

an image generating unit operable to generate a program-start thumbnail image showing the obtained first image and a recording-start thumbnail image showing the second or the third image; and

a display unit operable to display the generated program-start thumbnail image and the generated recording-start thumbnail image.

18. The broadcast program recording apparatus according to Claim

17, further comprising:

a playback unit operable to read and play back a program recorded on the recording medium in one of selectable playback modes, wherein

5 the selectable playback modes include a first playback mode in which the playback unit searches the recording medium for an image shown by the program-start thumbnail image, and starts the playback from the searched image, and

10 the display unit displays, together with the program-start thumbnail image, search playback image information representing the first playback mode.

19. The broadcast program recording apparatus according to Claim 18, wherein

15 the selectable playback modes further includes a second playback mode in which the playback unit starts the playback from an image shown by the recording-start thumbnail image, and the display unit displays, together with the recording-start thumbnail image, non-search playback image information representing the second playback mode.

20. The broadcast program recording apparatus according to Claim 19, wherein

25 the display unit is further operable to generate a graphical image representing an entire length of a program recorded on the recording medium, to mark the generated graphical image so as to indicate where in the program the program-start thumbnail

image and the recording-start thumbnail image are located, and
to display the marked graphical image.

21. The broadcast program recording apparatus according to Claim
5 20, wherein

the storage area stores display information relating to
the program, in correspondence with the start position and the
recording-start position, and

the display unit displays the program-start thumbnail image
10 and the recording-start thumbnail image each together with the
display information.

22. Display data for displaying image data included in a broadcast
program recorded by a broadcast program recording apparatus that
15 is for receiving and recording broadcast programs, the display
data comprising:

a thumbnail image corresponding to a piece of image data
included in the recorded broadcast program; and

a graphical representation of a position of the thumbnail
20 image relative to the entire recorded broadcast program.

23. The display data according to Claim 22, wherein

the recorded broadcast program includes a target broadcast
program preset to be recorded,

25 the thumbnail image corresponds to image data located at
a beginning of the target broadcast program,

the display data further comprising:

search playback image information representing a playback mode in which the playback apparatus searches the recorded broadcast program for the image data corresponding to the thumbnail image and plays back the recorded broadcast program starting from the searched image data.

24. The display data according to Claim 22, wherein the thumbnail image corresponds to image data located at a beginning of the recorded broadcast program,

the display data further comprising:

non-search playback image information representing a playback mode in which the playback apparatus plays back the recorded broadcast program starting from the beginning of the recorded broadcast program.

25. An integrated circuit for a broadcast program recording apparatus that receives broadcast data and records a target broadcast program which is preset to be recorded onto a recording medium, the recording starting at a scheduled broadcast time of the target broadcast program,

the apparatus including an extension information obtaining unit operable to obtain extension information showing that broadcast of a program preceding the target broadcast program will be extended,

the circuit comprising:

a judging module operable to judge, if the extension information is obtained, whether broadcast data being recorded

after the scheduled broadcast time is segment data that is sufficiently shorter than the target broadcast program or program data;

a monitoring module operable to monitor, after the judging module judges that the broadcast data is segment data, whether segment data of a same type is consecutively received;

an extracting module operable to extract, if the judging module judges that the broadcast data is program data, an end time of a piece of segment data immediately preceding the program data, the extraction being performed when a predetermined condition is satisfied; and

a start-position recording module operable to record, as a start position of the target broadcast program, a position corresponding on the recording medium to the extracted end time.

26. A data position locating method for use by a broadcast program recording apparatus that receives broadcast data and records a target broadcast program which is preset to be recorded onto a recording medium, the method comprising the steps of:

obtaining extension information showing that broadcast of a program preceding the target broadcast program will be extended;

judging, if the extension information is obtained, whether broadcast data being recorded after the scheduled broadcast time is segment data that is sufficiently shorter than the target broadcast program or program data;

monitoring, after the broadcast data is judged in the

judging step to be segment data, whether segment data of a same type is consecutively received;

extracting, if the broadcast data is judged in the judging step to be program data, an end time of a piece of segment data immediately preceding the program data, the extraction being performed when a predetermined condition is satisfied; and

recording, as a start position of the target broadcast program, a position corresponding on the recording medium to the extracted end time.

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27. A data position locating program for use by a broadcast program recording apparatus that receives broadcast data and records a target broadcast program which is preset to be recorded onto a recording medium, the program comprising the steps of:

15 obtaining extension information showing that broadcast of a program preceding the target broadcast program will be extended;

judging, if the extension information is obtained, whether broadcast data being recorded after the scheduled broadcast time is segment data that is sufficiently shorter than the target broadcast program or program data;

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monitoring, after the broadcast data is judged in the judging step to be segment data, whether segment data of a same type is consecutively received;

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extracting, if the broadcast data is judged in the judging step to be program data, an end time of a piece of segment data immediately preceding the program data, the extraction being

performed when a predetermined condition is satisfied; and
recording, as a start position of the target broadcast
program, a position corresponding on the recording medium to
the extracted end time.

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28. A computer-readable recording medium storing a data position
locating program for use by a broadcast program recording
apparatus that receives broadcast data and records a target
broadcast program which is preset to be recorded onto another
recording medium, the program comprising the steps of:

obtaining extension information showing that broadcast of
a program preceding the target broadcast program will be
extended;

judging, if the extension information is obtained, whether
broadcast data being recorded after the scheduled broadcast time
is segment data that is sufficiently shorter than the target
broadcast program or program data;

monitoring, after the broadcast data is judged in the
judging step to be segment data, whether segment data of a same
type is consecutively received;

extracting, if the broadcast data is judged in the judging
step to be program data, an end time of a piece of segment data
immediately preceding the program data, the extraction being
performed when a predetermined condition is satisfied; and

recording, as a start position of the target broadcast
program, a position corresponding on the other recording medium
to the extracted end time.